SilverlineAN, Phase I

Completed Technology Project (2018 - 2019)

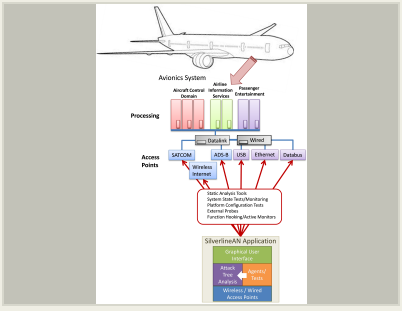
Project Introduction

Modern aircraft systems have slowly evolved towards integrated modular computing architectures that are linked to multiple external networks. These developments have introduced cyber-attack vulnerabilities which did not exist in older-generation avionics systems. To counter the emerging threats and increased vulnerabilities, an ability to comprehensively and systematically assess aviation cybersecurity risks is needed. Tools are needed to support the design of new aircraft systems as well as tools that can support routine inspections on an airframe-by-airframe basis. ATC-NY proposes SilverlineAN, an assessment management platform for aviation system-level cybersecurity. SilverlineAN provides a principled, machine-readable record of both manual and automated cybersecurity risk assessment procedures and results for individual components/subsystems, computes system-level metrics, and facilitates re-evaluation throughout the system's lifecycle. SilverlineAN aggregates individual component/subsystem results into a larger attack model, which can be used to assess system-level risk. The SilverlineAN tool can serve both as development tool and in a maintenance capacity. For example, during the development of a new avionics component under a Supplemental Type Certificate (STC), the developing organization could test the the component for cyber-vulnerabilities using the SilverlineAN tool. In a maintenance capacity, an AMT (Aviation Maintenance Technician) might use SilverlineAN to verify that an avionics installation or update on a particular airframe has not introduced any cyber-vulnerabilities.

Anticipated Benefits

SilverlineAN provides NASA with a capability to support ongoing aviation safety research. SilverlineAN can assess the cybersecurity and safety of integrated/advanced avionic systems; air-ground automation systems; and communications, navigation and surveillance (CNS) links. SilverlineAN can also help NASA assess the cybersecurity and safety risk of future concepts that depend on interconnected systems, including Single Pilot Operations (SPO), UAS Traffic Management (UTM), and on-demand mobility.

SilverlineAN is an integrated platform to protect current and future aviation systems from safety impacting cyber threats. The trend in aviation is greater sharing of data between aircraft and ground facilities as well as between aircraft. SilverlineAN supports the increasing need for security assessments for airworthiness certification (e.g. DO-326A). SilverlineAN lets providers better manage interconnected system-level security during design, certification and throughout the system lifecycle.



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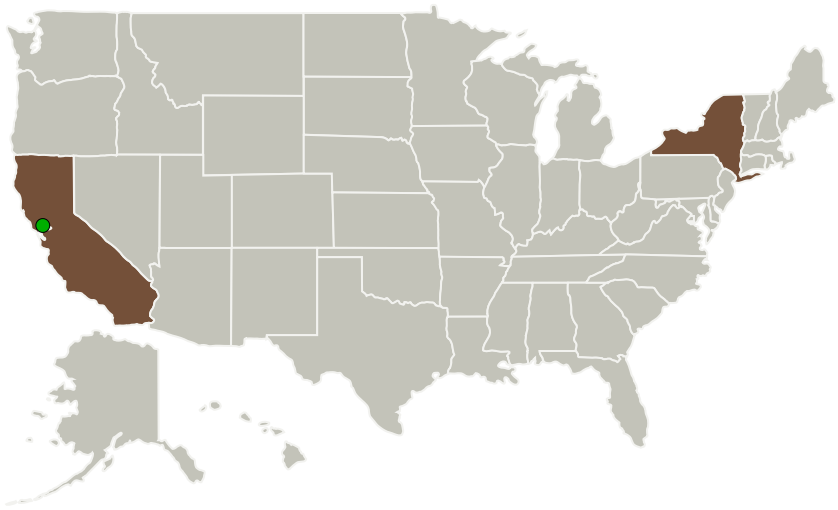
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
ATC-NY, Inc.	Lead Organization	Industry	Trumansburg, New York
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	New York

Project Transitions

July 2018: Project Start

February 2019: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137904)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

ATC-NY, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

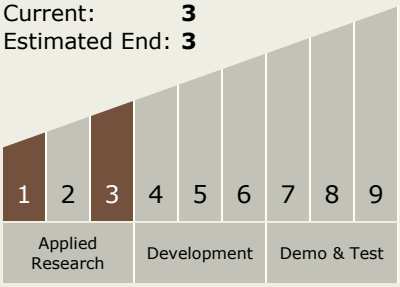
Carlos Torrez

Principal Investigator:

Robert Joyce

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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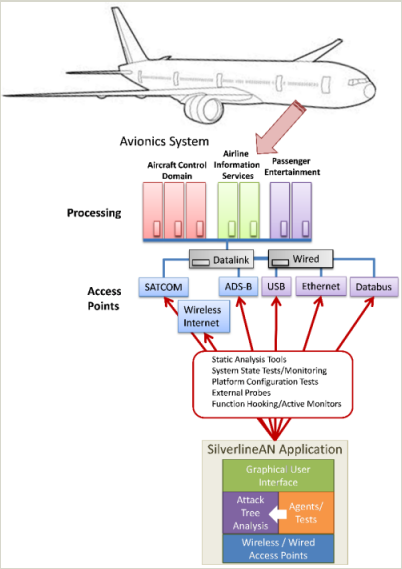
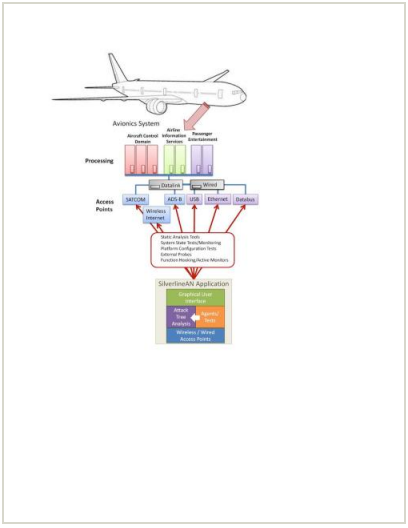
Images



Briefing Chart Image
SilverlineAN, Phase I
(https://techport.nasa.gov/image/127041)



Final Summary Chart Image
SilverlineAN, Phase I
(https://techport.nasa.gov/image/133742)

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.1 Aerosciences
    - TX15.1.6 Advanced Atmospheric Flight Vehicles

Target Destination

Earth